Report on RDMT Implementation

Systems Testing and Training

Office of the City Auditor | August 21, 2003

The City Council approved the Office of the City Auditor's 2003 Annual Performance Plan which included an audit of implementation of the RDMT project.

Summary

In conjunction with several regional partners, the City of Austin is nearing completion of a joint emergency communications project, called the Radio Dispatch and Mobile Transportation (RDMT) project. This project includes construction of a centralized public safety facility called the Combined Transportation and Emergency Communications Center (CTECC), an upgrade of the Computer-Aided Dispatch (CAD) system, replacement of the radio network and radio equipment with a Regional Radio System (Radio), and new Records Management Systems (RMS) for public safety departments.

This report is the second to be issued on implementation of the RDMT project. The purpose of our audit is to provide assurance that this $123 million initiative will be completed on time and within budget and will ultimately deliver expected functionality. Our previous report focused on the timely completion of the CTECC. This audit report focuses on testing for the new CAD, Radio, and Police RMS systems, as well as the nature and extent of training for system users. Although this report focuses primarily on system testing and training, we also followed up to verify completion of CTECC construction and updated our review of project budgets and schedules.

During this audit work, we found that testing for the CAD, RMS, and Radio projects is being conducted according to contract specifications and few system requirements are unresolved. In addition, training for the above projects has adhered to contract specifications and is proceeding as planned. We also noted that construction of the CTECC building is complete and projects continue to remain within budget and on schedule.

Objectives, Scope, and Methodologies

Audit Objectives:

- Determine whether RDMT systems are functioning as promised in contracts and system specifications.
- Determine whether training is being provided in accordance with project documentation to all facility and RDMT system users.
- Verify final completion of CTECC construction and update status of schedule and budget.

Scope:

As with the first RDMT audit, this audit examined the RDMT project and management team currently housed in the Financial Services Department. Our review of financial information and contract documents covered the inception of the project to the present, ending on August 5th. For review of testing and training for critical systems that support RDMT we focused on the timeframe of May 2003 to August 2003. Systems selected for review, specifically CAD, Radio, and Police RMS, were based on the RDMT schedule for testing and training for each system.

Methodologies:

Methodologies for this fieldwork included:

- Review of testing results for CAD, Radio, and Police RMS
- Review of training and testing plans and materials
- Observation of trainer and user training for several user groups
- Interviews with RDMT staff
- Review of data from City financial and project management systems
- Review of project schedules
- Comparison of observations to project documentation

This audit was conducted in accordance with generally accepted government audit standards.

Background

In the early 1990's, in response to new Federal Communication Commission (FCC) rules for voice radio equipment, the City of Austin and other government partners formed a regional coalition called the 911/RDMT Coalition.

These coalition members faced similar operational issues delivering public safety services across multiple jurisdictions. Members envisioned a state-of-the-art emergency communications system that would provide an integrated public safety telecommunications system and ensure unified response to emergencies within the Austin region. Coalition members are shown in Figure 1.

Construction of a single, shared facility and implementation of new public safety initiatives are expected to meet operational needs, facilitate exchange of information, coordinate response to incidents, and improve resource management.

The RDMT project encompasses the following public safety initiatives:

- **CAD –** Computer-Aided Dispatch System: A dispatch system that will improve the call taker and dispatcher's ability to provide information directly to units on the street using GIS mapping, addressing, and messaging features.

- **Radio** - Regional Radio System: A new radio communications network which includes construction of radio infrastructure (e.g. towers), installation of radio interface equipment, and purchase of radios.

- **RMS** - Records Management Systems for Police and Fire/Emergency Medical Services: Implementation of two new records management systems that automate manual processes and improve the timeliness and accessibility of records.

- **CTECC** - Combined Transportation and Emergency Communications Center: A regional emergency communication and transportation management center for the Austin area that includes incorporation of emergency- and transportation-related information systems into the facility.

In addition to the RDMT initiatives, all 911 and 311 call distribution will be housed in the CTECC facility. Eventually, but outside the scope of this audit, the CTECC will support several transportation elements: the Texas Department of Transportation's (TxDOT) advanced traffic management system, Capital Metro's fixed route management system, and a link to the City's Signals Division traffic management system.

Figure 1: Entities participating in All or Part of the RDMT Project

City of Austin - CAD, Radio, RMS, CTECC
Travis County - CAD, Radio, CTECC
TxDOT - CAD, Radio, CTECC
Capital Metro - Radio, CTECC
Austin Independent School District - Radio
City of Pflugerville - Radio
Texas House of Representatives - Radio
Texas Legislative Council - Radio
The University of Texas -Radio

SOURCE: RDMT Project Documentation

The $123 million RDMT project is being managed following the phases of the information technology life cycle and is now in the third phase, implementation, which includes:

- Management of contracts
- Installation of software
- Definition of rules and processes
- Data conversion and testing
- Dissemination of technical documentation and training
- Putting the system into production or "going-live."

Audit Results

During this audit, we found that the CTECC building is complete and projects continue to remain within budget and on schedule. In addition, testing for the CAD, RMS, and Radio projects is being conducted according to contract specifications and few system requirements are unresolved. Lastly, training for the above projects has adhered to contract specifications and is proceeding as planned.

The CTECC building is complete and projects continue to remain within budget and on schedule.

In our first report on the RDMT system we reviewed the status of CTECC completion and reviewed project budgets, expenditures, and schedules. For this report, we revisited both the construction status and the project budgets and schedules. Construction of the CTECC building is complete and properly documented. Also, all RDMT projects have remained within approved budgets and are adhering to established project schedules.

Construction of the CTECC building is now complete. As reported previously, a temporary Certificate of Occupancy was obtained for the CTECC building in May. A final Certificate of Occupancy was issued for all three buildings of the CTECC facility on August 11. This means that the final building inspection has been completed and City inspectors have received documentation of third party inspections. The construction project is also in the final stages of commissioning, which entails detailed walk-throughs by an independent party to ensure that all contract specifications are met.

The RDMT team is adhering to the latest approved budgets and schedules. All RDMT projects continue to proceed on schedule and within budget as approved by Council.

The RDMT projects are adhering to systems schedules and are still on target for a mid-October go-live. Few changes have been made to the overall schedule since our last review and system testing and system training are proceeding as outlined in the schedule.

The RDMT projects are also within budget with enough funds remaining to complete work. Since we last reviewed appropriations and expenditures in May, the appropriated amounts have remained the same and there has been approximately $5 million either expended or encumbered. The majority of this amount has been expended or encumbered for the Mobile Data project, which was just getting underway when we last reported.

For all RDMT systems, there is 12.9% of the budget remaining. The CAD project has the most funds remaining because it includes a $2.5 million 9-1-1 backup project which is still in the preliminary phase of work. The RMS project has the least funding remaining, and both the Fire/EMS and Police RMS are already in production. Figure 2 shows the approved budgets and expenditures for each RDMT project.

Figure 2: Project Financial Information

RDMT Project	Budgeted (as amended)	Expended or Encumbered	Balance	% Rem.
CTECC	$38,452,376	$35,340,483	$3,111,893	8.1%
CAD	$12,009,996	$8,549,399	$3,460,597	28.8%
Radio	$62,005,107	$53,665,319	$8,339,788	13.5%
RMS	$4,769,374	$4,556,013	$213,361	4.5%
Mobile Data	$5,865,000	$5,122,214	$742,786	12.7%
	$123,101,853	**$107,233,428**	**$15,868,425**	**12.9%**

SOURCE: City financial and project management systems, as of August 5, 2003.

Testing for the CAD, Radio, and RMS projects has been conducted according to contract specifications and few system requirements are unresolved.

At this time, testing for the Radio system and Police RMS is complete. All requirements for the RMS system have either passed functionality tests or been accepted by the project team. Both coverage and operational testing for the Radio system have been successfully completed. Testing for the CAD system is in the final stages, and most testing requirements have been met or resolved.

Test plans for the CAD, Radio, and RMS projects thoroughly document testing steps and requirements. Testing for the CAD and Police RMS systems involves use of traceability matrices, which contain test cases for individual features of each system. Test cases detail the system requirement and the steps required to verify if the system requirement is working. For example, one test case for CAD is "the system should, upon address verification, display a map centered on the incident location". The requirement is followed by instructions for how to verify that this feature is working. The test cases

are carried out by staff who walk through each test case and note the status, which is then input into a traceability database. Because of this format for testing, results of each test are thoroughly documented and any defects can be easily identified for follow-up by the contractor or the project team. For Radio, the test plan and contract require several stages of coverage and operational testing before the system is accepted by the City and partner agencies.

At this point, all test cases have been run on the CAD system and only six test cases are unresolved. There are 3,241 test cases and 35% of these are "must have" requirements. At this time, all but six test cases have been resolved, four of which are "must have" requirements. The six unresolved test cases have either been deferred for testing during the first mock go-live, which is scheduled for mid-September, or noted for future modification. Those deferred to mock go-live are test cases that require that remote dispatchers be able to use the system if connectivity to CTECC is lost, and therefore require simulation of losing connectivity to CTECC. In addition, all Demonstrations of Licensed Functionality (DOLFs) have been completed and signed off on by the contractor and the project manager.

Training sessions have offered additional ways to expand testing beyond core requirements. Some software glitches and desired modifications were identified during CAD user and trainer training sessions. Some glitches identified during these sessions will be resolved and tested prior to go-live acceptance. Other suggested modifications will be prioritized and considered by the vendor for future versions of the software.

Both coverage testing and operational testing for the Radio system have been successfully completed. As mentioned in our first report, coverage testing was completed successfully in May which indicated that the City and partners are getting desired radio coverage. Since our last report, operational testing has been underway for radio projects. The plans for operational testing require that the radio system operate for 60 days without any major operational failures. This 60 day operational test was successfully completed on July 31st and was signed off on by the City and vendor.

In addition, several City entities are already using the Radio system. To date, the Fleet Services and Water and Wastewater Departments are using the Radio system, as is the City/County EMS Department. Five Travis County agencies and the AISD Police Department are also using the Radio system.

All requirements for the RMS system have either passed functionality tests or been accepted as not passing by the project team. The Police RMS is already in use by the department. Initial RMS test results indicated that 39 of 174 test cases were outstanding (either failed or were deferred for later testing). The majority of these cases related to expected or desired functionality, rather than required functionality. Of the 39 cases that initially failed or were deferred, 17 later passed and 22 were accepted by the RMS user team. The accepted cases are those that were failed or deferred, but that failure or deference was accepted by the RMS testing team. For example, a "must have" requirement that the system permit user-defined security access at the field level failed, but the failure was accepted because the system provides flexible security for defined areas rather than at the field level.

Although not all training has been accomplished to-date, training for RDMT components has proceeded smoothly and followed contract specifications.

Training for using the new CAD system was specified in the contract, and it is being carried out according to contract plans. The Police RMS is already in use and user training will conclude shortly. All trainers for Radio have received training, and user training is underway.

Training for the new CAD system has followed specifications contained in the contract. Provision of training was incorporated into the contract for the CAD system. The vendor conducted a certified trainer program to train trainers, reviewed training guides, and evaluated user training provided by City trainers. For thorough coverage, trainer and user training involved lectures, hands on practice, and written coursework.

At this time, CAD training has been provided to trainers for each agency that will be using the system. In the City, these agencies are Police, Fire, EMS, and Aviation Police. At this time, user training is underway for all public safety call-takers and dispatchers.

Each user agency is conducting its own Radio training following a "train the trainer" approach. As specified in the contract, the vendor provided the initial training for all Radio trainers, which involved a 16-hour course on subscriber radio. Radio trainers for several user agencies expressed satisfaction with the instruction received, approving of the hands-on approach taken. End user training started in May 2003 and will end in the spring of 2004. Ultimately, about 10,000 users will have received the two-hour radio training course. As a way of ensuring training quality, the RDMT radio team is conducting random audits of the training classes, and trainers and students engage in follow-up conversations.

Training for the Police RMS was carefully designed to meet agency needs. Training for the Police RMS was designed by a team of patrol officers and civilian employees who also designed and implemented the system itself. The team developed the training with input from the system vendor on training content.

Training for the Police RMS is complete. Training for the Police RMS has been provided to approximately 1800 people. This training included Police Department staff such as patrol officers, detectives, and data analysts. Examination of trainee evaluations indicates that trainees have been satisfied with the training quality, although some have commented on improvements to course handouts and visual aids.

Office of the City Auditor
Austin, Texas

City Auditor
Stephen L. Morgan

Deputy City Auditor
Colleen Waring

Audit Team
Taylor Dudley, Assistant City Auditor
Corrie Stokes, Auditor-In-Charge
Marion Jarrett, Auditor

This report is available in our office or at our website, http://www.ci.austin.tx.us/auditor, in pdf format. You may also request additional hard copies through the website or by email at oca_auditor@ci.austin.tx.us. Please request Audit No. AU03308B

Printed on recycled paper

Management Response

The RDMT Projects consisting of the Computer Aided Dispatch, Regional Radio, Combined Transportation Emergency & Communications Center, and Police/Fire-EMS Records Management system replacements will all become operational systems in October 2003. The Office of the City Auditor has conducted a total of four audits over the last four consecutive years for these projects.

This last audit in 2003 occurred during a time when these projects required 100% focus from the limited resources assigned to them. An audit during this time was construed as a risk, as staff expended time collecting data, answering written inquiries and arranging observation meetings for audit staff. This risk did not occur, because of the professionalism of the City Auditor staff. Corrie Stokes and Marion Jarrett were very careful not to disrupt RDMT project activities. They provided requests in writing and were firm yet flexible about document delivery, arrangements for CTECC building walk-thrus, training observations, and accesses to RFPs, test cases, and training evaluation documentation. They provided written questions during interviews and allowed ample time for staff to retrieve documentation and answer inquiries.

The audit has proved beneficial to the RDMT Project Office. It confirmed that RDMT's use of repeatable processes in procurement, project planning and testing yields more successful results and products. It also pinpointed some deficiencies in RDMT's maintenance of eCapris that resulted in updated financial reporting to that system so that expenditures and appropriations are reconciled.

As RDMT comes to closure on these five major public safety projects, we feel positive that these systems will improve response times and service to Austin/Travis County citizens. We thank the Office of the City Auditor for its cooperation and patience during this Audit.

- Peter Collins, Acting Chief Information Officer